



June 14, 2016

Meagan E. Ormand Golder Associates Inc. 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227

RE: Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

# Dear Meagan Ormand:

Enclosed are the analytical results for sample(s) received by the laboratory between June 13, 2016 and June 14, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Nicole Gasiorowski

Micolo Yasicronske

nicole.gasiorowski@pacelabs.com

**Project Manager** 

Enclosures

cc: Ron DiFrancesco, Golder Associates Inc.
Martha Smith, Golder Associates Inc.
Mike Williams, Golder Associates Inc







# **CERTIFICATIONS**

Project: **BREMO WEEKLY PROCESS** 

Pace Project No.: 92301116

**Ormond Beach Certification IDs** 

8 East Tower Circle, Ormond Beach, FL 32174

Alabama Certification #: 41320 Connecticut Certification #: PH-0216

Delaware Certification: FL NELAC Reciprocity

Florida Certification #: E83079 Georgia Certification #: 955

Guam Certification: FL NELAC Reciprocity Hawaii Certification: FL NELAC Reciprocity

Illinois Certification #: 200068

Indiana Certification: FL NELAC Reciprocity

Kansas Certification #: E-10383

Louisiana Certification #: FL NELAC Reciprocity

Louisiana Environmental Certificate #: 05007

Maryland Certification: #346 Michigan Certification #: 9911

Mississippi Certification: FL NELAC Reciprocity

Missouri Certification #: 236

Montana Certification #: Cert 0074

**Charlotte Certification IDs** 

9800 Kincey Ave. Ste 100, Huntersville, NC 28078 North Carolina Drinking Water Certification #: 37706 North Carolina Field Services Certification #: 5342

North Carolina Wastewater Certification #: 12

**Asheville Certification IDs** 

2225 Riverside Drive, Asheville, NC 28804 Florida/NELAP Certification #: E87648 Massachusetts Certification #: M-NC030

North Carolina Drinking Water Certification #: 37712

Nebraska Certification: NE-OS-28-14

Nevada Certification: FL NELAC Reciprocity

New York Certification #: 11608

North Carolina Environmental Certificate #: 667

North Carolina Certification #: 12710 North Dakota Certification #: R-216 Oklahoma Certification #: D9947 Pennsylvania Certification #: 68-00547 Puerto Rico Certification #: FL01264 South Carolina Certification: #96042001

Tennessee Certification #: TN02974 Texas Certification: FL NELAC Reciprocity

US Virgin Islands Certification: FL NELAC Reciprocity

Virginia Environmental Certification #: 460165 Wyoming Certification: FL NELAC Reciprocity

West Virginia Certification #: 9962C

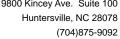
Wisconsin Certification #: 399079670

Wyoming (EPA Region 8): FL NELAC Reciprocity

South Carolina Certification #: 99006001 Florida/NELAP Certification #: E87627 Kentucky UST Certification #: 84

Virginia/VELAP Certification #: 460221

North Carolina Wastewater Certification #: 40 South Carolina Certification #: 99030001 Virginia/VELAP Certification #: 460222





# **SAMPLE ANALYTE COUNT**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92301116001	T2-160613-1024-S3	EPA 1664B	JMS	1	PASI-C
		EPA 200.7	CKJ	1	PASI-O
		Trivalent Chromium Calculation	CKJ	1	PASI-O
		EPA 200.8	CKJ	10	PASI-O
		EPA 245.1	JMW	1	PASI-A
		SM 2540D	SAM	1	PASI-A
		EPA 218.7	AEM	1	PASI-O
		EPA 350.1	AES2	1	PASI-A
		SM 4500-CI-E	AES2	1	PASI-A
92301116002	T4-160613-0927-S3	EPA 1664B	JMS	1	PASI-C
		EPA 200.7	CKJ	1	PASI-O
		Trivalent Chromium Calculation	CKJ	1	PASI-O
		EPA 200.8	CKJ	10	PASI-O
		EPA 245.1	JMW	1	PASI-A
		SM 2540D	SAM	1	PASI-A
		EPA 218.7	AEM	1	PASI-O
		EPA 350.1	AES2	1	PASI-A
		SM 4500-CI-E	AES2	1	PASI-A

(704)875-9092



# **PROJECT NARRATIVE**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Method: EPA 1664B

**Description:** HEM, Oil and Grease **Client:** Golder\_Dominion\_Bremo

**Date:** June 14, 2016

# **General Information:**

2 samples were analyzed for EPA 1664B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

# Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

# **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

# Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

# **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

# Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Method: EPA 200.7
Description: 200.7 MET ICP

Client: Golder\_Dominion\_Bremo

**Date:** June 14, 2016

# **General Information:**

2 samples were analyzed for EPA 200.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

# Sample Preparation:

The samples were prepared in accordance with EPA 200.7 with any exceptions noted below.

# Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

# **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

# Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

# **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

# Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

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# **PROJECT NARRATIVE**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Method: Trivalent Chromium Calculation
Description: Trivalent Chromium Calculation
Client: Golder\_Dominion\_Bremo

**Date:** June 14, 2016

# **General Information:**

2 samples were analyzed for Trivalent Chromium Calculation. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

# Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

# **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

# **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

# Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Method: EPA 200.8

**Description:** 200.8 MET ICPMS **Client:** Golder\_Dominion\_Bremo

**Date:** June 14, 2016

# **General Information:**

2 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

# Sample Preparation:

The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

# Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

# **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

QC Batch: MPRP/31047

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- LCS (Lab ID: 1605809)
  - Silver

# Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

# Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

## **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

# Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

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# **PROJECT NARRATIVE**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Method: EPA 245.1 Description: 245.1 Mercury

Client: Golder\_Dominion\_Bremo

**Date:** June 14, 2016

# **General Information:**

2 samples were analyzed for EPA 245.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

# Sample Preparation:

The samples were prepared in accordance with EPA 245.1 with any exceptions noted below.

# Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

# **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

# Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

# **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

# Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

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# **PROJECT NARRATIVE**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Method: SM 2540D

**Description:** 2540D TSS, Low-Level **Client:** Golder\_Dominion\_Bremo

**Date:** June 14, 2016

# **General Information:**

2 samples were analyzed for SM 2540D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

# Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

# **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

# **Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: WET/45512

D6: The precision between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 1754864)Total Suspended Solids
- ·



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Method: EPA 218.7

**Description:** Hexavalent Chromium by IC **Client:** Golder\_Dominion\_Bremo

Date: June 14, 2016

# **General Information:**

2 samples were analyzed for EPA 218.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

# Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

# **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

# **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

# Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Method: EPA 350.1

Description: 350.1 Ammonia

Client: Golder\_Dominion\_Bremo

**Date:** June 14, 2016

# **General Information:**

2 samples were analyzed for EPA 350.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

# **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

# Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

# **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

# **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

# Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Method: SM 4500-CI-E Description: 4500 Chloride

Client: Golder\_Dominion\_Bremo

**Date:** June 14, 2016

# **General Information:**

2 samples were analyzed for SM 4500-Cl-E. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

# Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

# **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

# **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

# Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

# **Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.



# **ANALYTICAL RESULTS**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Date: 06/14/2016 09:18 PM

Sample: T2-160613-1024-S3	Lab ID: 923	01116001	Collected: 06/13/1	6 10:24	Received: 06	6/13/16 13:50 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Met	hod:						
Collected By	L. Hamelman			1		06/13/16 10:34		
Collected Date	6/13/16			1		06/13/16 10:34		
Collected Time	10:24			1		06/13/16 10:34		
Field pH	8.3	Std. Units	0.10	1		06/13/16 10:34		
HEM, Oil and Grease	Analytical Met	hod: EPA 166	64B					
Dil and Grease	ND	mg/L	5.0	1		06/14/16 07:45		
200.7 MET ICP	Analytical Met	hod: EPA 200	0.7 Preparation Met	hod: EP	A 200.7			
Tot Hardness asCaCO3 (SM 2340B	76100	ug/L	3300	1	06/14/16 11:40	06/14/16 18:05		
Trivalent Chromium Calculation	Analytical Met	hod: Trivalen	t Chromium Calcula	tion				
Chromium, Trivalent	ND	ug/L	5.0	1		06/14/16 18:47	16065-83-1	
200.8 MET ICPMS	Analytical Met	hod: EPA 200	0.8 Preparation Met	hod: EP	A 200.8			
Antimony	ND	ug/L	5.0	1	06/14/16 11:40	06/14/16 15:26	7440-36-0	
Arsenic	46.8	ug/L	5.0	1	06/14/16 11:40	06/14/16 15:26	7440-38-2	
Cadmium	ND	ug/L	1.0	1	06/14/16 11:40	06/14/16 15:26	7440-43-9	
Copper	ND	ug/L	5.0	1	06/14/16 11:40	06/14/16 15:26	7440-50-8	
ead	ND	ug/L	5.0	1	06/14/16 11:40	06/14/16 15:26	7439-92-1	
lickel	ND	ug/L	5.0	1		06/14/16 15:26		
Selenium	ND	ug/L	5.0	1		06/14/16 15:26		
Silver	ND	ug/L	0.40	1		06/14/16 15:26		
Thallium	ND	ug/L	1.0	1		06/14/16 15:26		
linc	ND	ug/L	25.0	1	06/14/16 11:40	06/14/16 15:26	7440-66-6	
45.1 Mercury	Analytical Met	hod: EPA 245	5.1 Preparation Met	hod: EP	A 245.1			
Mercury	ND	ug/L	0.10	1	06/14/16 11:20	06/14/16 16:13	7439-97-6	
2540D TSS, Low-Level	Analytical Met	hod: SM 2540	OD .					
Total Suspended Solids	1.4	mg/L	1.0	1		06/14/16 10:34		
lexavalent Chromium by IC	Analytical Met	hod: EPA 218	3.7					
Chromium, Hexavalent	ND	ug/L	3.0	3		06/14/16 13:28	18540-29-9	
350.1 Ammonia	Analytical Met	hod: EPA 350	).1					
Nitrogen, Ammonia	ND	mg/L	0.20	1		06/14/16 13:55	7664-41-7	
500 Chloride	Analytical Met	hod: SM 450	0-CI-E					
Chloride	16.7	mg/L	5.0	1		06/14/16 13:10	16887-00-6	



# **ANALYTICAL RESULTS**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Date: 06/14/2016 09:18 PM

Sample: T4-160613-0927-S3	Lab ID: 923	01116002	Collected: 06/13/1	6 09:27	Received: 06	6/13/16 13:50 N	/latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
Field Data	Analytical Metl	nod:						
Collected By	L. Hamelman			1		06/13/16 09:37		
Collected Date	6/13/16			1		06/13/16 09:37		
Collected Time	9:27			1		06/13/16 09:37		
Field pH	8.1	Std. Units	0.10	1		06/13/16 09:37		
IEM, Oil and Grease	Analytical Meth	hod: EPA 166	4B					
Dil and Grease	ND	mg/L	5.0	1		06/14/16 07:45		
00.7 MET ICP	Analytical Meth	nod: EPA 200	.7 Preparation Met	hod: EP/	A 200.7			
ot Hardness asCaCO3 (SM 2340B	74500	ug/L	3300	1	06/14/16 11:40	06/14/16 18:09		
Trivalent Chromium Calculation	Analytical Meth	nod: Trivalent	Chromium Calculat	tion				
Chromium, Trivalent	ND	ug/L	5.0	1		06/14/16 18:47	16065-83-1	
00.8 MET ICPMS	Analytical Meth	hod: EPA 200	.8 Preparation Met	hod: EP/	A 200.8			
antimony	ND	ug/L	5.0	1	06/14/16 11:40	06/14/16 15:32	7440-36-0	
arsenic	42.4	ug/L	5.0	1	06/14/16 11:40	06/14/16 15:32	7440-38-2	
Cadmium	ND	ug/L	1.0	1	06/14/16 11:40	06/14/16 15:32	7440-43-9	
Copper	ND	ug/L	5.0	1	06/14/16 11:40	06/14/16 15:32	7440-50-8	
ead	ND	ug/L	5.0	1	06/14/16 11:40	06/14/16 15:32	7439-92-1	
lickel	ND	ug/L	5.0	1	06/14/16 11:40	06/14/16 15:32	7440-02-0	
Selenium	ND	ug/L	5.0	1	06/14/16 11:40	06/14/16 15:32	7782-49-2	
Silver	ND	ug/L	0.40	1		06/14/16 15:32		
hallium	ND	ug/L	1.0	1		06/14/16 15:32		
inc	ND	ug/L	25.0	1	06/14/16 11:40	06/14/16 15:32	7440-66-6	
45.1 Mercury	Analytical Meth	hod: EPA 245	.1 Preparation Met	hod: EP/	A 245.1			
Mercury	ND	ug/L	0.10	1	06/14/16 11:20	06/14/16 16:15	7439-97-6	
540D TSS, Low-Level	Analytical Meth	hod: SM 2540	)D					
otal Suspended Solids	ND	mg/L	1.0	1		06/14/16 10:34		
lexavalent Chromium by IC	Analytical Meth	nod: EPA 218	.7					
Chromium, Hexavalent	ND	ug/L	3.0	3		06/14/16 13:41	18540-29-9	
50.1 Ammonia	Analytical Meth	nod: EPA 350	.1					
litrogen, Ammonia	ND	mg/L	0.20	1		06/14/16 13:56	7664-41-7	
500 Chloride	Analytical Meth	hod: SM 4500	)-CI-E					
hloride	16.2	mg/L	5.0	1		06/14/16 13:11	16887-00-6	



Project: **BREMO WEEKLY PROCESS** 

Pace Project No.:

92301116

QC Batch: QC Batch Method:

**EPA 1664B** 

GCSV/25252 Analysis Method: **EPA 1664B** 

Analysis Description:

1664 HEM, Oil and Grease

Associated Lab Samples: 92301116001, 92301116002

METHOD BLANK: 1754701

Associated Lab Samples:

92301116001, 92301116002

Blank

Result

Reporting

Parameter

Units

Limit

Analyzed

88

Qualifiers

Oil and Grease

Oil and Grease

mg/L

mg/L

ND

Matrix: Water

5.0 06/14/16 07:43

LABORATORY CONTROL SAMPLE: 1754702

Parameter

Spike Units Conc.

LCS Result 40

LCS % Rec % Rec Limits

Qualifiers

MATRIX SPIKE SAMPLE:

Date: 06/14/2016 09:18 PM

1754703

Parameter

92300515002 Result

Spike Conc.

40

35.4

MS Result

MS % Rec

78-114

% Rec

Qualifiers

Oil and Grease

Units mg/L

7.4

43.4

90

Limits

78-114



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Date: 06/14/2016 09:18 PM

QC Batch: MERP/9595 Analysis Method: EPA 245.1

QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury

Associated Lab Samples: 92301116001, 92301116002

METHOD BLANK: 1754938 Matrix: Water

Associated Lab Samples: 92301116001, 92301116002

Parameter Units Result Limit Analyzed Qualifiers

Mercury ug/L ND 0.10 06/14/16 15:59

LABORATORY CONTROL SAMPLE: 1754939

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Mercury ug/L 2.5 2.5 102 85-115

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1754940 1754941

MS MSD 92301113001 Spike Spike MS MSD MS MSD % Rec Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD Qual ug/L ND 2.5 2.5 70-130 2 Mercury 2.5 2.5 100 99

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Date: 06/14/2016 09:18 PM

QC Batch: MPRP/31048 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET

Associated Lab Samples: 92301116001, 92301116002

METHOD BLANK: 1605824 Matrix: Water

Associated Lab Samples: 92301116001, 92301116002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Tot Hardness asCaCO3 (SM 2340B ug/L ND 3300 06/14/16 17:30

LABORATORY CONTROL SAMPLE: 1605825

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Tot Hardness asCaCO3 (SM 2340B ug/L 165000 162000 98 85-115

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1605826 1605827 MS MSD 92301121001 Spike Spike MS MSD MS MSD % Rec Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD Qual

Tot Hardness asCaCO3 (SM ug/L 75400 165000 165000 245000 243000 102 101 70-130 1 2340B

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

LABORATORY CONTROL SAMPLE:

Thallium

Date: 06/14/2016 09:18 PM

Zinc

QC Batch: MPRP/31047 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET

Associated Lab Samples: 92301116001, 92301116002

METHOD BLANK: 1605808 Matrix: Water

1605809

ug/L

ug/L

Associated Lab Samples: 92301116001, 92301116002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L		5.0	06/14/16 15:21	
Arsenic	ug/L	ND	5.0	06/14/16 15:21	
Cadmium	ug/L	ND	1.0	06/14/16 15:21	
Copper	ug/L	ND	5.0	06/14/16 15:21	
Lead	ug/L	ND	5.0	06/14/16 15:21	
Nickel	ug/L	ND	5.0	06/14/16 15:21	
Selenium	ug/L	ND	5.0	06/14/16 15:21	
Silver	ug/L	ND	0.40	06/14/16 15:21	
Thallium	ug/L	ND	1.0	06/14/16 15:21	
Zinc	ug/L	ND	25.0	06/14/16 15:21	

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	150	147	98	85-115	
Arsenic	ug/L	100	101	101	85-115	
Cadmium	ug/L	10	9.9	99	85-115	
Copper	ug/L	50	50.3	101	85-115	
Lead	ug/L	100	103	103	85-115	
Nickel	ug/L	50	51.2	102	85-115	
Selenium	ug/L	150	143	96	85-115	
Silver	ug/L	50	50.6	101	85-115 C	H

150

200

MATRIX SPIKE & MATRIX S	PIKE DUPLICAT	E: 16058	10		1605811						
			MS	MSD							
	92	301116001	Spike	Spike	MS	MSD	MS	MSD	% Rec		
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	Qual
Antimony	ug/L	ND	150	150	150	151	97	97	70-130	1	
Arsenic	ug/L	46.8	100	100	145	146	98	99	70-130	1	
Cadmium	ug/L	ND	10	10	9.6	9.7	96	97	70-130	1	
Copper	ug/L	ND	50	50	49.0	50.2	97	99	70-130	3	
Lead	ug/L	ND	100	100	104	104	104	104	70-130	0	
Nickel	ug/L	ND	50	50	50.3	51.3	98	100	70-130	2	
Selenium	ug/L	ND	150	150	149	142	98	93	70-130	5	
Silver	ug/L	ND	50	50	48.6	49.4	97	99	70-130	2	
Thallium	ug/L	ND	150	150	165	164	110	109	70-130	0	

164

200

109

100

85-115

85-115

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

70-130

2

98



# **QUALITY CONTROL DATA**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Date: 06/14/2016 09:18 PM

Zinc

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1605810 1605811 MS MSD 92301116001 Spike Spike MS MSD MS MSD % Rec Parameter Units Conc. % Rec RPD Result Conc. Result Result % Rec Limits Qual

200

193

197

96

ND

200

ug/L

Qualifiers



# **QUALITY CONTROL DATA**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

QC Batch: WET/45512 Analysis Method: SM 2540D

QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids

Associated Lab Samples: 92301116001, 92301116002

METHOD BLANK: 1754862 Matrix: Water

Associated Lab Samples: 92301116001, 92301116002

Blank Reporting
Parameter Units Result Limit Analyzed

Total Suspended Solids mg/L ND 1.0 06/14/16 10:31

LABORATORY CONTROL SAMPLE: 1754863

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Suspended Solids** mg/L 250 258 103 90-110

SAMPLE DUPLICATE: 1754864

Date: 06/14/2016 09:18 PM

 Parameter
 Units
 Parameter Result
 Dup Result
 Result
 RPD
 Qualifiers

 Total Suspended Solids
 mg/L
 1.6
 1.3
 21
 D6



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Date: 06/14/2016 09:18 PM

QC Batch: WETA/58680 Analysis Method: EPA 218.7

QC Batch Method: EPA 218.7 Analysis Description: Chromium, Hexavalent IC

Associated Lab Samples: 92301116001, 92301116002

METHOD BLANK: 1605685 Matrix: Water

Associated Lab Samples: 92301116001, 92301116002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Chromium, Hexavalent ug/L ND 1.0 06/14/16 11:39

LABORATORY CONTROL SAMPLE: 1605686

Spike LCS LCS % Rec
Parameter Units Conc. Result % Rec Limits Qualifiers

Chromium, Hexavalent ug/L .075 .069J 91 85-115

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1605687 1605688

MS MSD 92300722001 Spike Spike MS MSD MS MSD % Rec Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD Qual Chromium, Hexavalent ug/L 0.16 85-115 .38 .38 .55J .54J 103 101 1



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Date: 06/14/2016 09:18 PM

QC Batch: WETA/27945 Analysis Method: EPA 350.1

QC Batch Method: EPA 350.1 Analysis Description: 350.1 Ammonia

Associated Lab Samples: 92301116001, 92301116002

METHOD BLANK: 1754900 Matrix: Water

Associated Lab Samples: 92301116001, 92301116002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Nitrogen, Ammonia mg/L ND 0.20 06/14/16 13:46

LABORATORY CONTROL SAMPLE: 1754901

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Nitrogen, Ammonia mg/L 5.1 103 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1754902 1754903

MS MSD 92301113001 Spike Spike MS MSD MS MSD % Rec Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD Qual Nitrogen, Ammonia ND 5 5 5.0 90-110 mg/L 5.0 100 100 0



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Date: 06/14/2016 09:18 PM

QC Batch: WETA/27946 Analysis Method: SM 4500-CI-E
QC Batch Method: SM 4500-CI-E Analysis Description: 4500 Chloride

Associated Lab Samples: 92301116001, 92301116002

METHOD BLANK: 1754906 Matrix: Water

Associated Lab Samples: 92301116001, 92301116002

Parameter Units Result Limit Analyzed Qualifiers

Chloride mg/L ND 5.0 06/14/16 13:04

LABORATORY CONTROL SAMPLE: 1754907

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chloride mg/L 20 20.1 101 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1754908 1754909

MS MSD 92301113001 Spike Spike MS MSD MS MSD % Rec Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD Qual 17.6 90-110 Chloride mg/L 10 10 26.9 26.7 93 91 1



# **QUALIFIERS**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### **LABORATORIES**

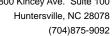
PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-O	Pace Analytical Services - Ormond Beach

# **ANALYTE QUALIFIERS**

Date: 06/14/2016 09:18 PM

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D6 The precision between the sample and sample duplicate exceeded laboratory control limits.





# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92301116

Date: 06/14/2016 09:18 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92301116001 92301116002	T2-160613-1024-S3 T4-160613-0927-S3		FLD/ FLD/		
92301116001 92301116002	T2-160613-1024-S3 T4-160613-0927-S3	EPA 1664B EPA 1664B	GCSV/25252 GCSV/25252		
92301116001 92301116002	T2-160613-1024-S3 T4-160613-0927-S3	EPA 200.7 EPA 200.7	MPRP/31048 MPRP/31048	EPA 200.7 EPA 200.7	ICP/18521 ICP/18521
92301116001	T2-160613-1024-S3	Trivalent Chromium Calculation	ICP/18526		
92301116002	T4-160613-0927-S3	Trivalent Chromium Calculation	ICP/18526		
92301116001 92301116002	T2-160613-1024-S3 T4-160613-0927-S3	EPA 200.8 EPA 200.8	MPRP/31047 MPRP/31047	EPA 200.8 EPA 200.8	ICPM/12570 ICPM/12570
92301116001 92301116002	T2-160613-1024-S3 T4-160613-0927-S3	EPA 245.1 EPA 245.1	MERP/9595 MERP/9595	EPA 245.1 EPA 245.1	MERC/9222 MERC/9222
92301116001 92301116002	T2-160613-1024-S3 T4-160613-0927-S3	SM 2540D SM 2540D	WET/45512 WET/45512		
92301116001 92301116002	T2-160613-1024-S3 T4-160613-0927-S3	EPA 218.7 EPA 218.7	WETA/58680 WETA/58680		
92301116001 92301116002	T2-160613-1024-S3 T4-160613-0927-S3	EPA 350.1 EPA 350.1	WETA/27945 WETA/27945		
92301116001 92301116002	T2-160613-1024-S3 T4-160613-0927-S3	SM 4500-CI-E SM 4500-CI-E	WETA/27946 WETA/27946		



# Document Name:

# Sample Condition Upon Receipt(SCUR)

Document No.: F-MEC-CS-009-Rev.03

Document Revised: May 24, 2016 Page 1 of 2

Issuing Authority:
Pace Mechanicsville Quality Office

Sample Condition Upor Receipt Courier:	Gol	me: der/f	oven	1D	15		Project #	: <b>V</b>			23	01	11(		ONILY
Commercia I	☐Fed Ex ☐Pace /	LJUPS	∐us ∐ot	PS her:/		ЦС	lient	9	2301	   16					
Custody Seal Present?	√Yes	□No Seal	s Intact?	ØΥ	es	No	)		400	A 100			,	-12-	11.
Packing Material: Thermometer: RMD001 Correction Factor: 0.0°C Temp should be above free USDA Regulated Soil (	ezing to 6°C N/A, water samp	Corrected (°C		of Ice:	lone ☑Wet	_	Biolo	None	Tissue	✓Sam Frozen?	nples on i	ice, cool Yes	ing proce	RS ess has be	B egun A
Yes No	- varantine zone v	Attill the Office	J States: CA	A, INY, OF	SC (cneck	map				nate fron and Puer			e (interna □N		
			-						Comm	nents/Di	iscrepan	су:			
Chain of Custody Present?			Yes	□No	□n/a	1.									_
Samples Arrived within Hold			₹Ves	□No	□N/A	2.									_
Short Hold Time Analysis (<7			Yes	<b>V</b> No	□N/A	3.									4
Rush Turn Around Time Requ Sufficient Volume?	Jested?	×	✓Yes	□No	□N/A	4.									4
			Yes	□No	□N/A	5.						-			4
Correct Containers Used?			¥Yes	□No	□N/A	6.									
-Pace Containers Used?			Yes	□No	□N/A	-									4
Containers Intact?			Yes	□No	□N/A	7.									4
Samples Field Filtered?	,		Yes	□No	<b></b> √N/A	8.	Note if se	edime	nt is vis	ible in th	ne dissol	ved cor	tainer		4
Sample Labels Match COC?		1.11	Yes	□No	□n/a	9.									
-Includes Date/Time/ID/An All containers needing acid/bachecked? All containers needing preserve	se preservation		Yes	□No	□N/A		HNG3 pH<2 HG pH<2			-					
compliance with EPA recomm (HNO <sub>3</sub> , $H_2$ SO <sub>4</sub> , HCI<2; NaOH >9 Exceptions: VOA, Coliform, TO	endation? Sulfide, NaOH:	12 Cyanide)	√√Yes	□No	□n/a		H2SO4 pH<2 NaOH pH>12								
DRO/8015 (water) DOC,LLHg		· -,	Yes	□No	□N/A		NaOH/ZnOAc pH>	9							
Samples checked for dechloring	ation?		□Yes	□No	N/A	11.						34			1
Headspace in VOA Vials (>5-6n	nm)?		□Yes	□No	M/A	12.									
Frip Blank Present?			Yes	□No	N/A	13.									
Frip Blank Custody Seals Prese			☐Yes	□No	☑N/A										
Pace Trip Blank Lot # (if purcha															
CLIENT NOT	TFICATION/RESC	DLUTION								Field I	Data Req	uired?	□Yes	No	
Person Contacted: Comments/Sample Discrepancy:							Date/Tim	ne: _						<del></del>	
Project Manager SCURF	Review:	N	M4				_	Date:		(	ie   14	1/14			
Project Manager SRF Ro Note: Whenever there is a disc Out of hold, incorrect preserva	repancy affectin	g North Carolina incorrect contai	compliance		, а сору о	f this	form will be	Date:	o the N	orth Card	O \\	4/10 INR Cert	2tification	Office (i.	e.



# CHAIN-OF-CUST Y / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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					es to be performed unde )8	ADDITIONAL											74-10061	72-1606	SAMPLE ID  (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE	Section D Required Client Information		equested Due Date/TAT:	804-551-0129	Mormand@golder.com	Richmond, VA 23227	2108 W Laburnum Ave,	Golder Associates	ection A equired Client Information:	www.pacelabs.com
					l analyses to be performed under Golder-Pace MSA dated	ADDITIONAL COMMENTS											14-160613 -0927-53	72-160613-1024-53	, , , , , , , , , , , , , , , , , , ,	Valid Matrix Codes  MATRIX COD  DRINKING WATER DW		24 HOUR	Fax: 804-358-2900	der.com	23227	num Ave, Ste 200	ates		cam
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